DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

A16NM
Revision 5
Gulfstream Aerospace LP
1125 WESTWIND ASTRA
ASTRA SPX

April 12, 2002

TYPE CERTIFICATE DATA SHEET No. A16NM

This data sheet which is a part of Type Certificate No. A16NM prescribes conditions and limitations under which the aircraft for which the Type Certificate was issued meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder. Gulfstream Aerospace LP
C/o Israel Aircraft Industries, LTD., Department 4199
Ben Gurion International Airport
70100, Israel

Type Certificate Holder Record. Israel Aircraft Industries, LTD. transferred ownership of Type Certificate A16NM to Gulfstream Aerospace LP on March 26, 2002

I. Model 1125 Westwind Astra (Transport Category), Approved August 29, 1985.

Engines. Two AlliedSignal (formerly Garrett Turbine Engine Company) TFE 731-3A-200G or TFE 731-3C-200G per FAA Type Certificate Data Sheet E6WE-13 (January 22, 1993)

Fuel. Conforming to Garrett Turbine Engine Company Specifications EMS 53111 (Jet A type), EMS 53112 (Jet A-1 & JP-8 types), EMS 53116 (JP-5 type) and EMS 53113 (Jet B & JP-4 types) as per LIMITATIONS SECTION of approved Airplane Flight Manual.

Oil. Conforming to Garrett Turbine Engine Company Specification EMS 53110 type 2.

Fuel Control Computer. Two Garrett Turbine Engine Company fuel computers P/N 2101144-5/-6.

Engine Limits.

Static thrust at sea level, LBS

- Maximum continuous	3,700
- Take-off (5 minutes)	3,700

Maximum continuous permissible engine operating speeds for the engine rotors, % RPM (RPM)

- Low Pressure Rotor (N1)	101.5 (21000)
- High Pressure Rotor (N2)	100.0 (29692)

Maximum Interstage Turbine Temperature (ITT), ºC	-3A	-3C
- Maximum Continuous	885	910
- Take-Off (5 minutes)	907	910
- During Starting	907	910

Maximum Oil Inlet Temperature, ºC	Up to 30,000 ft	Above 30,000 ft.
- Fan Gearbox	127	140
- Fan Gearbox Transient (2 minutes)	149	149
- Accessory Gearbox	149	157

Oil Pressure, PSIG

- Normal Operating	38 to 46
- At Idle, Minimum	25
- Maximum	55

Maximum bleed and power extraction:
- See Garrett Turbine Engine Company Installation Manual IM-8001

Airspeed Limits:

	1125 BASIC	*1125 IW
- V_{mo} (Max Operating) S.L. to 25000 ft.	360 KCAS	
- M_{mo} Above 25000 ft.	0.85 M	
- M_{mo} with Autopilot disengaged above 22500 ft.	0.81 M	
- V_{mo} (Max Operating) S.L. to 26360 ft.		350 KCAS
- M_{mo} Above 26360 ft.		0.85 M
- M_{mo} with Autopilot disengaged above 24130 ft.		0.81 M
- V_a (Maneuvering)		
- At 23500 LBS:		
- SL to 10000 ft	233 KCAS	
- At 37000 ft	280 KCAS	
- V_a varies linearly from 233 KCAS at 10000 ft to 280 KCAS at 37000 ft.		
- At 24650 LBS:		
- SL to 10000 ft		233 KCAS
- At 37000 ft		280 KCAS
- V_a varies linearly from 233 KCAS at 10000 ft. to 280 KCAS at 37000 ft.		
- At 18000 LBS:		
- SL to 20000 ft	204 KCAS	204 KCAS
- At 41000 ft	250 KCAS	250 KCAS
- V_a varies linearly from 204 KCAS at 20000 ft to 250 KCAS at 41000 ft.		
- Above 41000 ft	0.85M	0.85 M
- V_{fe} (Flaps 12º and slats 25º)	250 KCAS	250 KCAS
- V_{fe} (Flaps 20º and slats 25º)	225 KCAS	225 KCAS
- V_{fe} (Flaps Landing 40º and slats 25º)	180 KCAS	180 KCAS
- V_{sb} (Airbrakes Operation) No speed Limitation		
- V_{le} and V_{lo} (L/G Extension and Operating Speed)	180 KCAS	180 KCAS
- V_{mca} (Flaps 12º and 20º)	92 KCAS	92 KCAS
- V_{mcg} (Flaps 12º and 20º)	89 KCAS	89 KCAS
- Tire Limit Ground Speed: KTS (MPH)	182 (210)	182 (210)

* SEE NOTE 4

II. Model Astra SPX (Transport Category) Approved January 8, 1996

The Model Astra SPX is a derivative of the Model 1125 Westwind Astra. The changes include: installation of AlliedSignal (Garret) TFE 731-40R-200G engines; installation of winglets and minor structural modifications to the wing; installation of Collins pro-line 4 avionics; and a new Airplane Flight Manual to take credit for the aerodynamic and performance improvements.

Engines. Two AlliedSignal Engines TFE 731-40R-200G per FAA Type Certificate Data Sheet E1NM-1 (July 13, 1995)

Fuel. Conforming to AlliedSignal Engines Specifications EMS 53111 (Jet A type), EMS 53112 (Jet A-1 & JP-8 types), EMS 53116 (JP-5 type) and EMS 53113 (Jet B & JP-4 types) as per LIMITATIONS SECTION of approved AFM.

Oil. Conforming to AlliedSignal Engines Specification EMS 53110 type 2.

Fuel Control Computer. Two AlliedSignal Engines Digital Electronic Engine Controller P/N 2118882-3001/-3002/-3003. Both engines must be equipped with the same P/N Controller.

Engine Limits.

Static thrust at sea level, LBS

- Maximum continuous	4,250
- Take-off (5 minutes)	4,250

Maximum continuous permissible engine operating speeds for the engine rotors, % RPM (RPM)

- Low Pressure Rotor (N1)	100.0 (21000)
- High Pressure Rotor (N2)	101.0 (31485)

Maximum Interstage Turbine Temperature (ITT), ºC

- Maximum Continuous	991
- Take-Off (5 minutes)	991
- Take-Off (5 minutes) with APR On	1013
- During Starting	991

Maximum Oil Inlet Temperature, ºC	Up to 30,000 ft	Above 30,000 ft.
- Fan Gearbox	127	140
- Fan Gearbox Transient (2 minutes)	149	149
- Accessory Gearbox	149	157

Oil Pressure, PSIG

- Normal Operating	65 to 80
- At Idle, Minimum	50
- Maximum	100

Maximum bleed and power extraction:
- See Garrett Turbine Engine Company Installation Manual IM-8010

Airspeed Limits:

- V_{mo} (Max Operating) S.L. to 27600 ft.	350 KCAS
- M_{mo} Above 27600 ft.	0.87 M
- M_{mo} with Autopilot disengaged and Mach Trim inoperative above 23900 ft.	0.81 M
- V_a (Maneuvering)	
- At 24650 LBS:	
- S.L. to 10000 ft	233 KCAS
- At 37000 ft	280 KCAS
- V_a varies linearly from 233 KCAS at 10000 ft to 280 KCAS at 37000 ft.	
- At 18000 LBS:	
- S.L. to 20000 ft	204 KCAS
- At 41000 ft	250 KCAS
- V_a varies linearly from 204 KCAS at 20000 ft to 250 KCAS at 41000 ft.	
- Above 41000 ft	0.87M
- V_{fe} (Flaps 12º and slats 25º)	250 KCAS
- V_{fe} (Flaps 20º and slats 25º)	225 KCAS
- V_{fe} (Flaps Landing 40º and slats 25º)	180 KCAS
- V_{sb} (Airbrakes Operation) No speed Limitation	
- V_{le} and V_{lo} (L/G Extension and Operating Speed)	180 KCAS
- V_{mca} (Flaps 12º and 20º)	100 KCAS
- V_{mcg} (Flaps 12º and 20º)	100 KCAS
- Tire Limit Ground Speed: KTS (MPH)	182 (210)

DATA PERTINENT TO ALL MODELS

C.G. Range.

Approved center of gravity range is as shown in the following tables:
(Gear extension and retraction moment is negligible).

1125 BASIC	*1125 IW and ASTRA SPX
12,100 LBS - 39.00 % MAC	12,100 LBS - 39.00 % MAC
12,100 LBS - 36.40 % MAC	12,100 LBS - 36.40 % MAC
12,900 LBS - 19.60 % MAC	12,900 LBS - 19.60 % MAC
16,500 LBS - 19.60 % MAC	16,500 LBS - 19.60 % MAC
21,250 LBS - 25.00 % MAC	21,250 LBS - 25.00 % MAC
23,650 LBS - 30.39 % MAC	24,800 LBS - 32.97 % MAC
23,650 LBS - 39.00 % MAC	24,800 LBS - 39.00 % MAC

LINEAR VARIATION BETWEEN POINTS
* SEE NOTE 4

Datum.

Fuselage Station 0, is located 92.78 inches forward of airstairs opening aft frame.

Mean Aerodynamic Chord (MAC).

86.26 inches with leading edge at Fuselage Station 233.94.

Leveling Means.

Longitudinally: Place level on either seat rail at fuselage station 200 parallel to A/C centerline.
Laterally: Place level on seat rails at fuselage station 200 at 90º to A/C centerline.

Maximum Weight:

	1125 BASIC	1125 IW & ASTRA SPX
- Ramp Gross Weight	23650 lbs	24800 lbs
- Max Takeoff Weight	23500 lbs	24650 lbs
- Max Landing Weight	20700 lbs	20700 lbs
- Max Zero Fuel Weight	16000 lbs	17000 lbs

Minimum Crew.

Two (Pilot and Copilot)

Maximum Passengers.

Nine

Maximum Baggage.

Central Tank Extension (CTE) STATUS:	LBS	ARM(INCHES)
- CTE installed (full or empty)	370	358
- CTE not installed	1100	350

Fuel Capacity.

Fuel Tanks	LH WING	CENTER (w/o CTE)	CENTER (w/ CTE)	RH WING
Total/Usable Fuel (LBS)	1936/1920	4857/4852	5530/5525	1936/1920
Arm (INCHES)	256.1	278.5	285.3	256.1
Unusable Fuel (LBS)	16	5	5	16
Arm (INCHES)	236.5	228.5	228.5	236.5

Density: 6.7 LBS/U.S. Gallon
See Note 1 for data on Fuel System

Oil Capacity.

	*TOTAL (LBS)	*USABLE(LBS)	ARM(INCHES)
-3A & -3C Engines	36	8	394
-40R Engines	32	8	394

*For Both Engines Combined
Density: 8.2 LBS/U.S. Gallon
See Note 1 for Data on Oil System)

Maximum Operating Altitude. 45,000 ft.

Other Operating Limitations. Aircraft shall be operated according to operating limitations specified in approved airplane flight manual. (See notes 4 and 6.)

Control Surface Movements.

Surface	Travel (at trailing edge)		Tolerance
Aileron	Up	15º	+0º-30'
	Down	15º	+0º-45'
Aileron Trim	Up	5º	± 1º
	Down	5º	
Rudder	Left	22º	± 30'
	Right	22º	
Rudder Trim Tab	Left	11º30'	+ 2º-1º
	Right	11º30'	
Elevator	Up	22º	± 30'
	Down	12º	
Elevator Gear Tab	Up	4º30'	± 30'
	Down	9º30'	± 15'
Stabilizer Trim	Up	1º	± 15'
(Leading Edge)	Down	12º	± 30'
Airbrakes	Up	20º	± 1º
Slats	Down	25º	+ 1º-2º
Flaps	Max Down	40º	+1º-1º30'

Manufacturer's Serial Numbers Eligible. Models 1125 Westwind Astra and 1125 IW - S/N 001, 002, 004 and Subsequent. Model Astra SPX - S/N 073, 079 and Subsequent.

Import Requirements, A U.S. Airworthiness Certificate may be issued on the basis of an Israeli Certificate of Airworthiness for Export signed by a representative of the Civil Aviation Administration of Israel (CAAI) containing the following statement: "The airplane covered by this certificate has been examined, tested and found to conform to the type design approved under FAA Type Certificate No. A16NM, and to be in condition for safe operation".

Certification Basis. Models 1125 Westwind Astra and 1125 IW

- 14 CFR Part 21.29
- 14 CFR Part 25, effective February 1, 1965, including Amendments 25-1 through 25-54.
- SFAR 27, effective February 1, 1974, including Amendments 27-1 through 27-5.
- 14 CFR Part 36, effective December 1, 1969, including Amendments 36-1 through 36-12.
- Special conditions for operation up to 45000 feet, per FAA S.C. No. 25-ANM-5.
- Special conditions for Automatic Takeoff Thrust Control System (ATTCS) installation, per FAA S.C. No. 25-ANM-5.
- Exemption No. 3692 from FAR 25.1305 (d) (3) Rotor Unbalance Indication.
- Compliance with ditching structural provisions of FAR 25.801(b) through (e) and 25.807(d) has been established.
- Equivalent safety: FAR 25.729 (e)(2) Landing Configuration Aural Warning.
- Equivalent safety: FAR 25.813(a) and 25.813(e) Emergency Exit Access, Lavatory Door (mod 6016).
- Equivalent safety: FAR 25.1305 Powerplant Instruments for APU Installation (mod 6043)

Model Astra SPX

- 14 CFR Part 21.29
- 14 CFR Part 25, effective February 1, 1965, including Amendments 25-1 through 25-54, plus Subpart B, Flight, Sections 25.21 through 25.255, and Subpart E, Powerplant, Sections 25.901 through 25.945, and 25.1011 through 25.1207, including Amendments 25-1 through 25-80, which have been applied to the changes or the areas affected by the change per the FAA derivative aircraft policy. In addition, the following specific regulations including Amendments 25-1 through 25-80 have been applied to the changes or the areas affected by the change per the FAA derivative aircraft policy:

Section	Title
25.305	Strength and deformation
25.307	Proof of structure
25.571	Damage tolerance & fatigue evaluation of structure
25.625	Fitting factors
25.629	Aeroelastic stability requirements
25.961	Fuel system hot weather operation
25.994	Fuel system components
25.997	Fuel strainer or filter
25.1001	Fuel jettisoning system
25.1305	Powerplant Instruments
25.1307	Miscellaneous equipment
25.1316	System lightning protection
25.1521	Powerplant limitations
25.1551	Oil quantity indication

Further, Section 25.729 Amendment 25-75 has been applied in lieu of the equivalent safety finding made for this section on the IAI Model 1125 Westwind Astra.

- 14 CFR Part 34, effective September 10, 1990.
- 14 CFR Part 36, effective December 1, 1969, including Amendments 36-1 through 36-20.
- Special Condition No. 25-ANM-104 for High Intensity Radiated Fields (HIRF).
- Special Condition No. 25-ANM-5 for operation to 45,000 feet and for ATTCS. Note: Compliance with Section 25.904, as promulgated by Amendment 25-62, was required for the ATTCS system in lieu of the Special Condition 25-ANM-5.
- An equivalent safety finding exists with respect to Section 25.1203(a) Fire detection system within the turbine tailpipe zone. In addition, the following equivalent safety findings, previously made for the IAI Model 1125 Westwind Astra under the provisions of Section 21.21(b)(1), are also applicable to the IAI Model Astra SPX:

Section 25.813(a) and (e)	Emergency exit access, lavatory door
Section 25.1305	Powerplant instruments for APU installation

- Compliance with the following optional requirements has been established:

Section 25.801	Ditching
Section 25.1419	Ice Protection

Production Basis. None

Equipment. The basic required equipment as prescribed in the applicable airworthiness regulation (see certification basis) must be installed in the aircraft for certification.
Models 1125 and 1125 IW - Master Equipment List Report No. 25W100/841717.
Model Astra SPX - Master Equipment List Report No. 25W000/950560

Service Information. Service bulletins, structural repair manuals, vendor manuals, aircraft flight manuals, and overhaul and maintenance manuals, which contain a statement that the document is Civil Aviation Administration of Israel (CAAI) approved, are accepted by the FAA and are considered FAA approved. These approvals pertain to the type design only.

NOTES:

NOTE 1. (a) Current weight and balance report including list of equipment included in certificated empty weight and loading instructions must be provided for each aircraft at the time of original certification.

(b) The airplane must be loaded so that the C.G. is within the specified limits at all times.

(c) The weight of fuel and oil systems fluid as defined below must be included in the empty weight of the airplane.

FUEL SYSTEM	LBS (Gallons)	ARM
- Unusable (drainable from tanks, drain and lines)	37 (5.5)	235.4
- Undrainable (trapped in tanks and lines)	24 (3.6)	235.4

OIL SYSTEM	Total (LBS) -3A & -3C engines	Total (LBS) -40 engine	ARM
- Unusable Drainable (systems)	20	16	394
- Undrainable (systems)	8	8	394

NOTE 2. All required placards listed in the Limitations Section of the Airplane Flight Manual must be installed in their proper locations.

NOTE 3. Information essential to the proper servicing and maintenance of the aircraft is contained in the Manufacturer's Maintenance Manual section of the Instructions for Continued Airworthiness Manual. Mandatory replacement time, structural inspection intervals and related structural inspection procedures are presented in the approved airworthiness limitations section of the Instructions for Continued Airworthiness Manual.

NOTE 4. Model 1125 Westwind Astra aircraft incorporating mod 5812 are eligible for maximum take off weight of 24650 LBS and must be operated according to the approved airplane flight manual marked "IW" (Increased Weight).

NOTE 5. Airplane Model 1125 with AlliedSignal TFE 731-3C engines installed, must be operated per Airplane Flight Manual Revision 18 or subsequent.

NOTE 6. Airplane Model Astra SPX must be operated according to the Approved Airplane Flight Manual marked P/N SPX-1001-1.

NOTE 7. Israel Aircraft Industries LTD. (IAI), located at Ben Gurion International Airport 70100, Israel, is licensed by Gulfstream Aerospace LP to manufacture and obtain Airworthiness Certificates for the Model aircraft listed in this Type Certificate Data Sheet for serial number 146 and subsequent.

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